Nesting Biology of Grassland Birds in the Military Ridge Prairie Heritage Area of Southwest Wisconsin 2004 Annual Report

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Introduction

America's native grasslands, once covering perhaps as much as 162 million ha in the Great Plains, have been reduced to as little as 0.1% of their former area. In Wisconsin and other parts of the Midwest, native grasslands have primarily been converted to agriculture. Birds that historically used these grasslands have survived by using remnant native grass, pastures, hay fields, and even row crops as substitutes for the once-extensive prairies. However, row crops have been shown to be poor habitat for nesting birds. In recent decades, many grassland bird species have exhibited population declines, raising concern about their future. In the Midwest, there has been a 39% increase in the acreage of row crops from 1964-1994, which has replaced many surrogate-grassland and grassland cover types. Loss of suitable habitat and the fragmentation of surviving grasslands (with the associated problems e.g., increased predation and brood parasitism) have been implicated in these declines.

This study is being conducted to gather data on the abundance and productivity of grassland birds in southwestern Wisconsin, and to help identify landscape characteristics that may be beneficial or detrimental to grassland birds. This information can help land managers allocate scarce resources to help improve grassland bird habitat in the region.

This report summarizes the information collected during the 2004 field season.

METHODS

Study Site

This study is taking place on lands in the Military Ridge area of southwestern Dane, northwestern Green, and southeastern Iowa counties in south-central Wisconsin. Land use in this area is primarily agricultural, with a large portion of the land in pasture, hay, and small grains, and relatively few acres of corn and soybeans. This area also has numerous prairie remnants (most privately owned) and high enrollment in the

Conservation Reserve Program (CRP). This area has been suggested as a potential site for Greater Prairie Chicken reintroduction, and the Wisconsin DNR has identified this region as one with the "greatest opportunities for landscape-scale management" (Krause 1995:1). It also falls within the boundaries of the Conservation Reserve Enhancement Program (CREP) that provides funds for long-term and permanent conservation easements.

Habitats where nest searching took place in the study area included CRP, prairie remnant, and pasture. CRP lands were planted in cool season, non-native grasses. Prairie remnants had native grasses and forbs, often mixed with cool season, non-native grasses. All remnants had been subjected to, and degraded by, grazing of varying intensity in the past. Pastures were composed of cool season grasses and were lands currently being grazed. Only pastures with relatively light grazing were used.

Nest Searching and Monitoring

Nest searching was conducted on 11 plots in 2004 (5 CRP, 2 pasture, 4 remnant prairie) beginning late May and ending approximately 15 July. Each site was searched an average of 4 times. All nest plots were approximately 10 ha in size; in larger fields, a 10 ha subset of the field was searched.

Nest searching was accomplished by a crew of 6-10 people systematically walking in a line abreast (approximately 2 m apart) across each plot until the entire area had been covered. As a person approached the nest, the adult would flush from the ground or vegetation. The area near where the bird flushed was then searched carefully until either the nest was found, or it appeared that the bird was not at a nest when flushed. In some cases the area was flagged so it could be checked again later. Once found, each nest was marked with a paint spot 4 m north or south of the nest, and a wire flag was placed at the paint spot when possible. Flags were not used where livestock were present, or they would attract the attention of the public and possibly lead to disturbance of the nest. Nests were monitored every 2-3 days until the nest either fledged or failed.

Vegetation

Vegetation measurements were taken at each nest using a Robel pole to measure height-density at the nest, and a Daubenmire frame was used to estimate vegetation cover. Height-density was recorded as an average of measures (one from each cardinal direction) of the height (to the nearest decimeter) at which the pole was obscured by vegetation. Cover estimates were made with the nest in the center of the frame, and within a meter of the nest in each quadrant defined by the cardinal directions. Each estimate of vegetation cover included % grass, % forb, % woody, % standing dead vegetation from last season, % bare ground, and % litter within the frame. Litter depth

(measured from the soil surface to the upper surface of the litter, not including dead vegetation from the current season) was recorded at 3 points within each Daubenmire frame.

Radio Telemetry 2004

To facilitate tracking movements of individual birds, adult and juvenile Eastern Meadowlarks were fitted with Holohil BD-2G radio transmitters, weighing 1.85 g and having an approximate battery life of 11 weeks. Adult birds were trapped at the nest using mist nets. Care was taken to minimize disturbance to vegetation around the nest and to minimize the chance of abandonment. Transmitters were placed on juvenile birds when they were within 2-3 days of fledging. Once captured, each adult bird was fitted with colored leg bands, an aluminum band (juvenile birds were banded only with aluminum bands), and a transmitter secured with loops of elastic thread around the base of the legs. This attachment placed the transmitter on top of the synsacrum at or near the center of gravity. This technique of attaching the transmitter, and the low weight of the transmitter (less than 3% of body weight), minimizes interference with flying and normal activity (M. Gustafson, Bird Banding Lab, pers. comm.). Birds were subsequently tracked every 2-3 days (often daily) until the end of July, and approximately weekly thereafter until 10 September when many of the transmitters were past expected battery life.

RESULTS

Nest Searching

A total of 111 nests of 11 species were found during the study period (Table 1), 110 of which had useable data; we were unable to determine the fate of one nest. Nesting success was higher for CRP and prairie in 2004 than previous years (Table 2). More nests were found in remnant prairie (65) than either CRP (28) or pasture (18) but contrary to previous years when nest success was highest in CRP, nest success was highest in remnant prairie (57%), followed by CRP (50%) and pasture (31%; Table 2). Eastern Meadowlark nests were found most often in prairie and CRP (21 and 12 nests, respectively) followed by pasture (4 nests), while Grasshopper Sparrow nests were found primarily in prairie (28 of 38 nests) (Table 3). Bobolink nests were found primarily in CRP (5 of 7 nests) (Table 3), while Henslow's Sparrow nests (7) were found exclusively in CRP. For all nests, predation accounted for all but 6 of the nests that failed; six nests were abandoned. See Table 3 for success rates for selected species.

Radio Telemetry 2004

Transmitters were attached to 11 adult and 25 juvenile Eastern Meadowlarks. We were able to track 22 birds for at least 1 month after the transmitter was attached. Tracking was terminated after 10 September because all of the transmitters were past the expected battery life, and it was becoming difficult to find birds because of weak signals. One adult and two juvenile birds lost their transmitters (no signs of depredation), and at least 5 juveniles were depredated (carcasses and transmitters were recovered); 1 juvenile carcass was found with a broken leg, the presumed cause of death. The remaining birds (11) were either depredated and the transmitters destroyed, the radios failed, or the bird left the area (we could only determine that the signal wasn't detected in the study area). Most birds stayed within 500 m of where they were banded until the signal was lost or tracking terminated, but two juveniles and one adult independently moved approximately 2 km from the nest site, a greater distance than seen in previous years. Both adults and juveniles were often found in similar habitat to that in which they nested or were fledged. This contrasts with Kershner's (2001) findings from Illinois where over half of the birds left the study area after a nest attempt concluded.

No banded meadowlarks from previous years were detected through the course of this study. Only two females were documented re-nesting (2004) and both birds were successful in their first attempts.

Other Activities

Four papers were presented at conferences summarizing project findings. A paper titled "Grassland bird habitat use, productivity, and movements in an agricultural landscape" presented at the Midwest Fish and Wildlife Conference held at Kansas City, MO in December 2003. A paper titled "Behavior of Eastern Meadowlarks as determined by telemetry" was presented at the Wisconsin Society for Ornithology annual meeting at Chippewa Falls, WI in May 2004. A paper titled "Grassland birds in southwestern Wisconsin: The importance of prairie remnants" was presented at the North American Prairie Conference held in Madison, WI in August 2004. A paper titled "Breeding and post-breeding habitat use and movements of Eastern Meadowlarks in Wisconsin" was presented at the annual meeting of The Wildlife Society held in Calgary, Alberta, Canada in September 2004.

Future Work

The data collected in this report will be used for the PHD dissertation of M. Guzy. We expect that dissertation to be completed by summer 2005.

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Table 1. Summary of nests found by species in 2004.

Species	# nests
Bobolink	7
Clay-colored Sparrow	3
Chipping Sparrow	2
Eastern Meadowlark	37
Field Sparrow	3
Grasshopper Sparrow	38
Henslow's Sparrow	7
Savannah Sparrow	5
Song Sparrow	4
Upland Sandpiper	4
Western Meadowlark	1

Table 2. Summary of nest success by habitat for 2001-2003 combined versus 2004.

	CRP	Prairie	Pasture
'01-3 Success	40%	24%	34%
'04 Success	50%	57%	31%
All years	42%	35%	34%

Table 3. Summary of nests found and success rates by habitat for selected species, 2004.

	CRP		Prairie		Pasture		Total	
	#	Success	#	Success	#	Success	#	Success
Eastern Meadowlark	12	42%	22	41%	4	25%	37	41%
Grasshopper Sparrow	2	50%	28	50%	8	38%	38	47%
Bobolink	5	20%	1	100%	1	0%	7	29%
Henslow's Sparrow	7	71%	0		0		7	71%